



Safety Program  
Installation Ergonomics Program

**Summary.** This regulation covers the policies and mandated procedures for establishing and managing the ergonomics program as an integral part of the National Training Center and Fort Irwin occupational safety and health program.

**Suggested improvements.** The proponent agency of this regulation is Industrial Hygiene, Preventive Medicine Service. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Commander, USA MEDDAC, ATTN: MCXK-PM-IH, Box 105109, Fort Irwin, California 92310-5109.

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CONTENTS

Chapter 1		Chapter 2	
<b>Introduction</b>	2	<b>The Ergonomics Program Component</b>	5
Section I		2-1. Goals	5
<b>General</b>	2	2-2. Organizational Involvement	6
1-1. Purpose	2	2-3. Effects of work related musculoskeletal disorders	6
1-2. Scope	2	2-4. Occupational risk factors	6
1-3. Objective	2		
Section II		Chapter 3	
<b>Responsibilities</b>	2	<b>Worksite Analysis</b>	6
1-4. Installation Commander	2	3-1. Problem Identification	6
1-5. The SOH Manager	2	3-2. Prioritization	7
1-6. The IMA	3	3-3. Detailed Analysis	7
1-7. The IEO	3	Chapter 4	
1-8. The Ergonomics Subcommittee	3	<b>Prevention and Controls of WMSDs</b>	7
1-9. Trained ergonomics personnel	3	4-1. Intervention hierarchy	7
1-10. Industrial Hygiene personnel	4	4-2. Process elimination	8
1-11. Installation Safety personnel	4	4-3. Engineering controls	8
1-12. Health Care personnel	4	4-4. Substitution	8
1-13. CPAC Staff	4	4-5. Work practices	8
1-14. The Director of Contracting Support	4t	4-6. Administrative controls	8
1-15. The Director of Public Works	5	4-7. Personal protective equipment	9
1-16. NTC Theater Support Command	5		
1-17. Union Representatives	5	Chapter 5	
1-18. Supervisors	5	<b>Health Care Management</b>	9
1-19. Military and Civilian personnel	5	5-1. Written protocol	9
		5-2. Early evaluation of patients	9
		5-3. Medical Evaluation	9
		5-4. Treatment	10

5-5. <i>Modified or restricted duty</i>	10
5-6. <i>Follow-up</i>	10
5-7. <i>Medical surveillance</i>	10
5-8. <i>Reporting</i>	10
5-9. <i>Worksite evaluation referrals</i>	10

## Chapter 6

<b>Education and Training</b>	<b>11</b>
6-1. <i>The "train the trainer" concept</i>	11
6-2. <i>Education</i>	11
6-3. <i>Training</i>	11

## Chapter 7

<b>Ergonomics Program Evaluation</b>	<b>11</b>
7-1. <i>Evaluation requirements</i>	11
7-2. <i>External evaluations</i>	12
7-3. <i>Internal evaluations</i>	12
7-4. <i>Regular evaluation and review</i>	12

## Appendixes

A. <i>References</i>	14
B. <i>Recommended Membership of the Ergonomics Subcommittee</i>	16

## Glossary

## Chapter 1

## Introduction

## Section I

## General

## 1-1. Purpose

This regulation establishes the policies, responsibilities, and procedures for identifying, evaluating, and controlling specific ergonomic problems.

## 1-2. Scope

This program applies to all elements of the National Training Center (NTC), tenant activities and contractor personnel.

## 1-3. Objective

It is the intent of this program to eliminate or materially reduce worker exposure to conditions that lead to cumulative trauma disorders (CTD's) and related injuries and illnesses through engineering controls and changes in work practices whenever feasible, thereby complying with the provisions of Army Regulation (AR) 40-5, Preventive Medicine, AR 385-10, Safety Department of Defense Instruction (DODI) 6055.1, DOD Occupational Safety and Health Program, Occupational Safety and Health Act of 1970 [Public Law (PL) 91-596]; Executive Order (EO) 12196, section 1-201; and Title 29, Code of Federal Regulations (CFR), Part 1960.8 (a).

## Section II

## Responsibilities

## 1-4. Installation commander

a. Designate a Command Safety and Occupational Health (SOH) Manager per AR 40-5 and AR 385-10.

b. Establish a SOH advisory council per AR 40-5 and AR 385-10. This council will be chaired by the Chief of Staff.

c. Establish an ergonomics subcommittee under the SOH council and integrate ergonomics into all phases of the Occupational Safety and Health (OSH) program per AR 40-5, paragraph 5-31.

d. Approve the installation ergonomics plan based on recommendations of the SOH advisory council.

e. Provide sufficient funds and other resources to carry out all responsibilities related to this program per AR 40-5, paragraph 1-4g(2) and AR 385-10, paragraph 2-1e.

f. Work with the installation personnel, the unions, the public, and the appropriate regulatory authorities to effectively address ergonomics issues.

g. Require appropriate reporting and record-keeping procedures be followed per AR 40-5, paragraphs 3-3 through 3-9, and AR 385-10, paragraph 1-4e.

h. Designate an Installation Ergonomics Officer (IEO) and selects members of the ergonomics subcommittee based on recommendations from the installation medical authority (IMA) and the IEO.

i. Demonstrate commitment to the ergonomics program.

## 1-5. The SOH Manager

a. Obtains and forwards the following to the IEO:

(1) Injury and Illness reports, including DA Form 3076, Army Occupational Health Report [RCS MED 20 (R4)].

(2) Occupational Safety and Health Administration (OSHA) No. 200 (Bureau of Labor Statistics Log and Summary of Occupational Injuries and Illnesses) or equivalent.

(3) Federal Employee Compensation Act (FECA) claims.

(4) DA Form 285, US Army Accident Report (RCS CSOCS-308), and DA Form 285-AB-R, US Army Abbreviated Ground Accident Report (AGAR) (RCS CSOCS-308).

(5) Medical and Safety records.

(6) Work force reports (including civilian personnel and pay reports of lost duty time as a result of injury or illness) and suggestions.

c. Provides reports to the installation command group and advises the commander on issues related to SOH including ergonomics.

#### 1-6. The IMA

a. Is Responsible to the commander for all medical aspects of the OSH program per AR 40-5, paragraph 1-4i.

b. Advises the SOH manager on appropriate individuals for membership on the ergonomics subcommittee.

c. Ensures a written protocol is developed for the early recognition, evaluation, treatment and follow up of work-related musculoskeletal disorders (WMSDs) among military and civilian personnel.

#### 1-7. The IEO

a. Will be a qualified health or safety professional who has received at least 40 hours of formal ergonomics training.

b. Advises the SOH manager on appropriate individuals for membership on the ergonomics subcommittee.

c. Chairs the ergonomics subcommittee, providing an interface between the ergonomics subcommittee and the SOH advisory council.

d. Develops and implements the installation ergonomics plan, with assistance of the ergonomics subcommittee and approval of the SOH advisory council.

e. Ensures that an internal evaluation and review of program objectives is conducted and reports the results of this review to the SOH advisory council, with assistance of the ergonomics subcommittee. The evaluation and review should be conducted quarterly or at least semiannually, using evaluation methods such as those depicted in Chapter 8 of this regulation.

f. Ensures accurate record-keeping of ergonomic subcommittee reports.

g. Oversees, manages, or actually performs the worksite analysis, and ensures its completion.

#### 1-8. The Ergonomics Subcommittee

a. Under the installation SOH advisory council, assists in developing and implementing the installation ergonomics plan.

b. Oversees and Participates in.

(1) Gathering and evaluating injury, lost work time, trend, productivity, and complaint data on work-sites and work processes.

(2) Identifying existing and potential WMSDs.

(3) Conducting worksite evaluations.

(4) Setting priorities for abatement of identified WMSDs

(5) Implementing Corrective Action

(6) Providing Appropriate Worker

Training

c. Develops methods to evaluate the effectiveness of the corrective actions and documents the results.

d. Works with medical personnel in the identification of potential WMSDs and advises medical personnel on ergonomic changes related to the workstation, tasks, and tools.

e. Provides at least semiannual reports to the installation SOH advisory council.

#### 1-9. Trained ergonomics personnel

Trained Ergonomics personnel are personnel who have met the minimum standards as specified in the glossary. They :

a. Serve on the installation ergonomics subcommittee.

b. Assist with Identification and Control of WMSDs (alone or as members of the ergonomics team).

c. Perform in-depth ergonomic assessments of identified problematic work areas, tasks, and tools to determine WMSD risk factors.

d. Document all evaluations recommendations, and actions related to ergonomics and the effectiveness of the actions.

e. Provide ergonomics training and education for military and civilian personnel. Persons tasked to provide training should obtain refresher ergonomics training to maintain expertise.

f. Work with medical personnel in the identification of potential WMSD and advise medical personnel on ergonomic changes related to the workstation, tasks and tools.

g. Participate in the ergonomics subcommittee's semiannual ergonomics program evaluation and review. An internal evaluation and review, performed quarterly, is recommended.

h. Keep accurate records of identified WMSDs and high-risk work areas and solutions. Provide these records to the ergonomics subcommittee for review and tracking. The records will be stored in the Health Hazard Information

Module (HHIM) once the function is available in the software.

#### **1-10. Industrial Hygiene (IH) Personnel**

- a. Serve on the installation ergonomics subcommittee.
- b. Consider WMSDs during routine worksite evaluations.
- c. Perform or assist in performing in-depth ergonomic assessments as needed.
- d. Assist in solving problems related to identified WMSDs.
- e. Keep accurate records of identified WMSDs and solutions and provide these records to the ergonomics subcommittee for review and tracking. The records will be stored in the Health Hazard Information Module (HHIM), once this function is available in the software.
- f. Provide ergonomics training and education for military and civilian personnel. Persons tasked to provide training should obtain refresher ergonomics training to maintain expertise.
- g. Work with medical personnel in the identification of potential WMSDs and advise medical personnel on ergonomic changes related to the workstation, tasks, and tools.

#### **1-11. Installation Safety Personnel**

- a. Serve on the installation ergonomics subcommittee.
- b. Oversee the safety aspects of the ergonomics program.
- c. Coordinate the annual Standard Army SOH Inspection required by AR 385-10, paragraph 4-1, with Occupational Health (OH) program personnel and consider WMSDs during the inspection.
- d. Maintain appropriate records, such as the Log of Federal Occupational Injuries and Illnesses, per AR 40-5, paragraph 5-22c, and AR 385-10, paragraphs 1-4e and 2-10.
- d. Review injury and illness records related to WMSDs, develop trend analyses, and report results to the ergonomics subcommittee.
- e. Assist with ergonomics training and education. Persons tasked to provide training should obtain refresher ergonomics training to maintain expertise.
- f. Perform or assist in performing in-depth ergonomics assessment as needed.
- g. Assist in solving problems related to identified WMSDs.
- h. Keep accurate records of identified WMSDs and high-risk work areas and solutions. Provide these records to the ergonomics subcommittee for review and tracking. The records

will be stored in the HHIM once this function is available in the software.

- i. Work with medical personnel in the identification of potential WMSDs and advise medical personnel on ergonomic changes related to the workstation, tasks, and tools.

#### **1-12. Health Care Personnel**

- a. Serve on the installation ergonomics subcommittee. A representative from specific health care areas (for example physician, nurse, occupational and physical therapists, physician assistant) will serve on the ergonomics subcommittee.
- b. Develop a written installation protocol for the early recognition, evaluation, treatment and follow up of WMSDs among military and civilian personnel.
- c. Develop and conduct baseline medical screening for new personnel whose positions have specific medical standards, physical requirements, or are covered by a medical evaluation program established under applicable regulations (5 CFR 339.301).
- d. Assist trained ergonomics personnel in the identification of modified or restricted duty jobs.
- e. Make specific recommendations to the Civilian Personnel Activities Center (CPAC) or unit on the assignment of injured workers to modified or restricted duty jobs.
- f. Assist personnel in training and education.

#### **1-13. The CPAC Staff**

- a. Uses local medical treatment facility (MTF), OH program, health care personnel, and ergonomics subcommittee recommendations and concerns in the employment placement office.
- b. Ensures newly appointed supervisors, managers, and personnel receive appropriate ergonomics training and are made aware of the benefits and responsibilities provided by AR 690-800, Chapter 810, subchapter 6.
- c. Maintains the case file data on lost duty time as a result of injury or illness and provides this information for review by the ergonomics subcommittee.
- d. Appoints at least one representative to serve on the ergonomics subcommittee. This should be the FECA coordinator or other appropriate personnel.

#### **1-14. The Director of Contracting Support**

- a. Ensures the integration of ergonomics considerations into the purchase of new equipment.
- b. Implements recommendations from

trained ergonomics personnel to reduce WMSDs when feasible.

c. Appoints an advisory or support representative to serve on the ergonomics subcommittee.

#### **1-15. The Director of Public Works (DPW)**

a. Integrates ergonomic considerations into facility modifications and construction.

b. Implements recommendations from trained ergonomics personnel to reduce WMSD risks when feasible.

c. Appoints an advisory or support representative to serve on the ergonomics subcommittee.

d. Ensures engineers and maintenance personnel:

(1) Prevent and correct WMSDs through job and workstation design and proper maintenance.

(2) Apply ergonomics concepts both in general and in regard to the specific conditions of the facility.

#### **1-16. The NTC Theater Support Command**

a. Ensures the integration of ergonomic considerations into the purchase of new equipment.

b. Implements recommendations from trained ergonomics personnel to reduce WMSDs.

c. Consults with trained ergonomics personnel to assist in the evaluation of equipment and furniture for ergonomic design.

e. Appoints an advisory or support representative to serve on the ergonomics subcommittee.

#### **1-17. Union representatives**

a. Serves as a member of the ergonomics subcommittee. All unions at the installation should be offered the opportunity to appoint an advisory or support member to the ergonomics subcommittee.

b. Ensures that key personnel recognize and report WMSDs.

#### **1-18. The Supervisor**

a. Ensures personnel are trained and

(1) Follows safe work practices

(2) Recognize, correct and report hazardous work practices.

(3) Recognize and report early symptoms of potential WMSDs

b. Routinely reviews work areas for potential WMSD risks.

c. Coordinates with trained ergonomics, safety and health personnel to reduce risks and support the overall ergonomics program.

d. Maintains effective schedules for facility, equipment and tool maintenance, adjustments and modifications.

e. Holds personnel accountable for failure to follow safe work practices and recognizes initiatives in improving operating conditions and procedures through incentive awards.

f. Ensures personnel are aware of benefits and responsibilities provided by AR 690-800, Chapter 810, sub chapter 6.

g. Ensures the integration of new ergonomic considerations into the purchase of new equipment.

#### **1-19. Military and Civilian Personnel participate in the ergonomics effort by:**

a. Modifying work practices as recommended

b. Notifying supervisors of potential WMSDs in the workplace.

c. Recognizing and reporting symptoms early.

d. Participating in the medical surveillance program.

e. Performing recommended conditioning activities.

f. Actively participating in the suggestion process.

g. Routinely review work areas, tasks, and tools for potential WMSD risk factors.

### **Chapter 2**

#### ***The Ergonomics Program Component.***

#### **2-1. Goals**

a. The goals of the ergonomics program are to—

(1) Prevent injuries by eliminating or reducing worker exposure to WMSD risk factors.

(2) Reduce the potential for fatigue, error, and unsafe acts by adapting the job and workplace to the worker's capabilities and limitations.

(3) Increase the overall productivity of the work force.

(4) Reduce workers' compensation claims and associated costs.

(5) Improve overall unit readiness.

b. An emphasis on early identification and prevention of WMSDs will preserve and protect our military and civilian work force while decreasing related costs.

**2-2. Organizational involvement**

A collaborative partnership among all levels of the working community is essential to achieve the goals of the ergonomics program. Command emphasis, commitment by management, and demonstrated visible involvement are imperative to provide the organizational resources and motivation necessary to implement a sound ergonomics policy. All levels of DA personnel (manager, supervisor, worker, and soldier) are accountable for their responsibilities regarding injury prevention and the identification and resolution of WMSDs.

**2-3. Effects of work-related musculoskeletal disorders**

a. Health effects. Repeated biomechanical stress and microtrauma cause or aggravate WMSDs. Over time, repeated microtrauma can evolve into a painful, debilitating state involving muscles, tendon, tendon sheaths, and nerves. Examples of WMSDs are--

- (1). Tendinitis.
- (2). Tenosynovitis.
- (3). Bursitis.
- (4). Chronic muscle strain.
- (5). Nerve entrapment syndromes (for example, carpal tunnel syndrome).

b. Economic effects. The expense associated with a poorly designed workplace is considerable and includes both direct and indirect costs.

(1) Direct costs include medical treatment, rehabilitation, and workers' compensation costs.

(2) Indirect costs include lost work time, decreased productivity, decreased work quality, retraining costs, and diminished morale.

**2-4. Occupational risk factors**

a. Research identifies the following as specific workplace conditions that can contribute to the development of WMSDs:

- (1) Repetitive motions (especially during prolonged activities).
- (2) Sustained or awkward postures.
- (3) Excessive bending or twisting of the wrist.
- (4) Continued elbow or shoulder elevation (for example, overhead work).
- (5) Forceful exertions (especially in an awkward posture).
- (6) Excessive use of small muscle groups (for example, pinch grip).
- (7) Acceleration and velocity of dynamic motions.
- (8) Vibration.

- (9) Mechanical compression.
- (10) Restrictive workstations (for example, inadequate clearances).
- (11) Improper seating or support.
- (12) Inappropriate hand tools.
- (13) Machine-pacing and production-based incentives.
- (14) Extreme temperatures.
- (15) Extended exposure to hazardous or annoying noise.

b. The combined effect of several risk factors in one job or workstation may lead to a higher probability of causing a WMSD.

**Chapter 3***Worksite Analysis***3-1. Problem identification**

Identification of jobs or worksites with WMSD risk factors can be accomplished using the following procedures of systematic passive and active surveillance.

a. Systematic passive surveillance. This procedure involves the analysis of data provided in existing monthly or quarterly reports. This analysis can identify WMSD problems, set intervention priorities, and organize the ergonomics effort. The office responsible for maintaining the records, logs, or reports will perform the systematic passive surveillance and communicate the results to the IEO and the ergonomics subcommittee. Sources of data include—

(1) Routine injury and illness reports including DA Form 3076.

(2) Log of federal Occupational Injuries and Illnesses or equivalent.

(3) FECA claims.

(4) DA Form 285 and DA Form 285-AB-R.

(5) Medical and Safety records.

(6) Work force reports (including civilian personnel and pay reports of lost duty time as a result of injury or illness) and suggestions.

b. Systematic active surveillance. This procedure involves focused and active efforts to gather information about WMSD hazards at worksites and to identify workers at risk of developing cumulative trauma disorder (CTD). Trained ergonomics personnel (see glossary) will perform active surveillance in conjunction with industrial hygiene or safety surveys or regular training.

(1) Examples of active surveillance procedures include—

(a) Questionnaires and surveys. Supervisor and worker questionnaires and symptom

or body part discomfort surveys provide information about WMSD hazards, often before actual injuries occur (USACHPPM TG 220). Trained ergonomics personnel can administer these surveys as a part of regular training or during walk-through surveys.

(b) Observation. Direct observation by trained ergonomics personnel conducting regular walk-through industrial hygiene or safety surveys can identify WMSD hazards. Worker interviews during these surveys can identify tasks or situations that are uncomfortable and may indicate WMSD risk factors. For example, workers note that cold temperatures make it difficult to grip hand tools.

(c) Sentinel event or incident reporting. Specific health or performance events, such as wrist pain, back pain, or increased errors, may be indicative of WMSD risks. A specific reporting procedure should be used to facilitate reports.

(d) Case referrals. Use case referrals to identify a work area with potential WMSD risk factors. For example, a laboratory technician seeks medical care for hand and wrist pain and provides an occupational history that indicates possible worksite risk factors.

(2) The presence of one WMSD should trigger an active surveillance survey using appropriate questionnaires or surveys (USACHPPM TG 220). Trained ergonomics personnel will perform systematic active surveillance at all worksites at least once per year. Also, trained ergonomics personnel will perform walk through surveys for any new significantly changed job, process, equipment, or method.

(3) In many cases, corrections to the WMSD hazards or risk factors are simple, quick, on-the-spot workplace changes. Trained ergonomics personnel conducting regular walk-through surveys can identify and implement the solution immediately. Chapter 4 provides information on prevention and control. More complex problems will require prioritization and detailed analysis.

(4) If a worksite or job is identified as high risk, special medical surveillance may be indicated. Chapter 5 provides information on health care management.

### 3-2. Prioritization

The ergonomics subcommittee or the appropriate subcommittee member (e.g., IH, safety, health care, etc.) will prioritize worksites for detailed analysis based on the passive and active surveillance information. The prioritization may be based on incidence rates, the number of workers affected, direct costs, lost work time, or severity of cases.

Calculate incidence and prevalence rate by unit, work section, or job series to identify high-risk areas. Use FECA claims information to identify high-cost injuries and high-risk work areas.

### 3-3. Detailed analysis

a. Detailed analysis is necessary for further evaluation of those jobs or worksites having WMSD risk factors as determined by systematic passive and active surveillance. When conducting the detailed analysis, trained ergonomics personnel (e.g., IH, safety, health care, etc.) should systematically—

(1) Consider the concept of multiple causation (see glossary for definition) and the degree of WMSD risk.

(2) Look for trends, including age, gender, work task, and the time of injury.

(3) Identify the work tasks or portions of the process that contain risk factors.

(4) Identify both problems and solutions.

b. The following data, analysis tools, and methods may be helpful during a detailed analysis:

(1) Incidence rates (OHSA No. 200 or equivalent), accident and injury reports, and lost work time or absenteeism reports by job, unit, department, or facility.

(2) Checklists, questionnaires, and interviews.

(3) Direct observation, videotape analysis, and job analysis.

(4) Tests, such as—

(a) Revised National Institute for Occupational Safety and Health (NIOSH) Equation for the Design and Evaluation of Manual Lifting Tasks.

(b) Static and dynamic strength testing.

(c) Timed activity analysis.

(d) Biomechanical analysis.

(e) Cardiovascular measurements.

## Chapter 4

### *Prevention and Control of Work-Related Musculoskeletal Disorders*

#### 4-1. Intervention hierarchy

The primary method of preventing and controlling exposure to WMSD hazards is through effective design (or redesign) of a job or worksite. Intervention methods are defined, in order of priority, in paragraphs 4-2 through 4-7.

**4-2. Process elimination**

Elimination of the demanding process essentially eradicates the WMSD hazard. For example, eliminate the use of the hand-held bar code scanner for logistics/inventory management personnel by providing an automatic bar code scanner.

**4-3. Engineering controls**

Ergonomic engineering controls redesign the equipment or worksite to fit the limitations and capability of workers. Equipment or worksite redesign typically offers a permanent solution. For example, provide a video display terminal workstation that can be adjusted to a wide range of anthropometric dimensions.

**4-4. Substitution**

Substituting a new work process or tool (without WMSD hazards) for a work process with identified WMSD hazards can effectively eliminate the hazard. For example, replace hand tools that require awkward wrist positions (extreme wrist flexion, extension, or deviation) with tools that allow a neutral wrist posture.

**4-5. Work practices.**

Practices that decrease worker exposure to WMSD risks include changing work techniques, providing personnel conditioning programs, and regularly monitoring work practices. Also included are maintenance, adjustment, and modification of equipment and tools as necessary.

a. Proper work techniques include methods that encourage correct posture, use of proper body mechanics, appropriate use and maintain of hand and power tools, and correct use of equipment and workstations.

b. Personnel conditioning refers to the use of a conditioning or break-in period. New and returning personnel may need gradual integration into a full workload, depending on the job and the person. Supervisors, trained ergonomics personnel, and health care personnel should identify those job that require a break in period. Health care personnel should evaluate those personnel returning from a health-related absence and define the break-in period for each individual person (5 CFR 339.301).

c. Regular monitoring of operations helps to ensure proper work practices and to confirm that the work practices do not contribute to cumulative trauma injury or hazardous risk factors.

d. Effective schedules for facility, equipment, and tool maintenance, adjustments, and modifications will reduce WMSD hazards. This includes ensuring proper working conditions, having

sufficient replacement tools to facilitate maintenance, and ensuring effective housekeeping programs. Tool and equipment maintenance may also include vibration monitoring.

**4-6. Administrative Controls**

Administrative controls can be used to limit the duration, frequency, and severity of exposure to WMSD hazards. Examples of administrative controls include, but are not limited to—

a. Reducing the number of repetitions by decreasing production rate requirements and limiting overtime work.

b. Reducing the number and speed of repetitions by reducing line or production speed or by having worker input into production speed (that is, using worker-based rather than machine-based production speed).

c. Providing rest breaks to relieve fatigued muscle-tendon groups. Determine the length of the rest break by the effort required, total cycle time, and the muscle-tendon group involved.

d. Increasing the number of personnel assigned to the task (for example, lifting in teams rather than individually).

e. Instituting job rotation as a preventive measure, with the goal of alleviating physical fatigue and stress to a particular set of muscles and tendons. Do not use job rotation in response to symptoms of cumulative trauma. This can contribute to symptom development in all personnel involved in the rotation schedule rather than preventing problems. Trained ergonomics and health care personnel should conduct an analysis of the jobs used in the rotation schedule.

f. Providing modified- or restricted-duty assignments to allow injured muscle-tendon groups time to rest, assisting in the healing process. Make every effort to provide modified- or restricted-duty assignments when physical limitations (as identified by a health care provider) allow the worker to return to work performing less than his or her normal work requirements. In regard to modified- or restricted-duty assignments:

(1) A health care provider should specifically identify assignments of job tasks for the individual worker based on his or her symptoms, capabilities, and limitations.

(2) Health care providers with specific knowledge in both occupational demands and cumulative trauma injuries should cooperate with trained ergonomics personnel to develop a list of jobs with low WMSD risk.

(3) Descriptions for each modified-duty assignment should be written. Civilian personnel representatives and supervisors, in



conjunction with health care personnel, should identify modified-duty assignments and tasks and write descriptions for these assignments and tasks that conform to documented requirements. A combination of tasks from one or more jobs can be used as a modified-duty assignment. The description for each modified-duty assignment should include WMSD risk factors and muscle-tendon groups required to perform the job.

#### 4-7. Personal protective equipment

Personal protective equipment (PPE) is not necessarily recommended for controlling exposure to WMSD hazards, as little research has been conducted to support claims of its usefulness.

a. **Appliances such as wrist rests, back belts, back braces, etc., are not considered PPE.** Before purchasing such devices, discuss their effectiveness with trained ergonomics personnel. The Office of the Surgeon General (OTSG) does not support the blanket use of back belts as a back injury preventive measure. Antivibration gloves are an example of PPE that addresses WMSD hazards.

b. Consider WMSD hazards when selecting PPE. The PPE—

- (1) Should be properly worn or used according to Army and manufacturers' specifications.
- (2) Should be available in a variety of sizes.
- (3) Should accommodate the physical requirements of personnel and the job.
- (4) Should **not** contribute to WMSD hazards.

### Chapter 5

#### *Health Care Management*

#### 5-1. Written protocol

Health care personnel will develop a written protocol for the early recognition, evaluation, treatment, and follow-up of WMSDs. This chapter provides the structure and much of the content of this protocol. The protocol includes communication with supervisors and military and civilian personnel to identify worksite problems and implement recommendations. Health care personnel should tailor the protocol to the National Training Center and provide it to the ergonomics subcommittee for review.

#### 5-2. Early evaluation of patients

Early recognition and medical management of WMSDs are critical to reduce the impact of injury to both personnel and the employer.

a. Common symptoms of WMSDs can include (but are not limited to) pain, tingling, numbness, and weakness in the neck, shoulders, arms, hands, back, and legs. Other symptoms can include headaches, visual fatigue, and increased errors.

b. Soldiers and civilian personnel with symptoms of WMSDs should report to medical personnel for an evaluation.

(1) Active duty soldiers should report to their primary care provider.

(2) Civilian personnel should report to Occupational Health with the appropriate forms: Department of Labor (DOL) Form CA-2 (Notice of Occupational Disease and Claim for Compensation) for all WMSDs except back injuries which require DOL Form CA-1 (Federal Employee's Notice of Traumatic Injury and Claim for Compensation) and DOL Form CA-16 (Authorization for Examination And/Or Treatment).

c. Supervisors should ensure that symptomatic soldiers report for a medical evaluation in a timely manner. Supervisors should encourage civilian personnel to report for a medical evaluation.

d. Disincentives for personnel reporting **must** be avoided.

#### 5-3. Medical evaluation

The initial medical evaluation of a patient with a possible WMSD should include a detailed medical and occupational history and a physical examination. A standardized questionnaire is a useful tool for obtaining the history. Health care personnel, within their approved scope of practice, will—

a. Complete a medical and occupational history that includes—

(1) Military occupational specialty, job title or series, and number of years and months at that job.

(2) Prior work history.

(3) A detailed description of current job tasks and the amount of time normally spent on each task.

(4) A detailed description of symptoms to include location, character (such as burning, sharp, dull, pins and needles), severity, onset, duration, and exacerbating and relieving factors.

(5) Lost time or limited duty due to symptoms.

(6) Prior evaluation, diagnosis, and treatment of symptoms.

(7) Other existing medical conditions and history of trauma and surgery.

(8) Activities and hobbies outside of work.

(9) Current medications.

b. Conduct a physical examination that includes, but need not be limited to—

- (1) Appearance (swelling, muscle atrophy, erythema, ecchymosis).
- (2) Range of motion and muscle strength.
- (3) Neurologic assessment (motor, sensory, reflexes).
- (4) Vascular assessment (pulses, capillary refill).
- (5) Evaluation for pain and tenderness.
- (6) Special tests, such as medial nerve percussion (Tinel's sign) and the wrist flexion test (Phalen's test) when appropriate.

c. Perform additional testing as indicated such as nerve conduction velocities, laboratory tests, and radiographic procedures.

#### 5-4. Treatment

Health care personnel will initiate appropriate treatment and rehabilitation as defined by current standards of medical practice. In general, try conservative therapy before invasive treatment.

a. Supervisors, CPAC, and coworkers will encourage civilian personnel with a suspected WMSD to seek evaluation and treatment in an Army MTF where possible, according to AR 690-800, chapter 810, subchapter 6. Priorities for care and authorization for treatment will be according to AR 40-5, paragraph 5-10a, and AR 40-3, paragraphs 2-3 and 4-20. Occupational health personnel will coordinate with the CPAC and Patient Administration Division when there are questions about a person's entitlement to care.

b. Active duty soldiers with a suspected WMSD will be seen in an Army MTF.

c. Army Reserve Component soldiers with a suspected Army-duty WMSD will be seen at an Army MTF according to AR 40-3, paragraph 4-2.

d. All contractor personnel will report to your respective safety office for further guidance.

#### 5-5. Modified or restricted duty

Health care personnel will coordinate with trained ergonomics personnel to recommend duty assignments that will not aggravate a patient's condition, as discussed in paragraph 4-6f.

#### 5-6. Follow-up

Health care personnel will perform regular follow-up for patient's being treated for WMSDs to monitor the efficacy of therapy and worksite intervention.

#### 5-7. Medical surveillance

a. A general screening medical surveillance program is not indicated for WMSDs. Instead, use the methods of problem identification as described in Chapter 3. Health care personnel, in cooperation with members of the ergonomics subcommittee, will—

(1) Conduct periodic, systematic worksite walk-through evaluations to remain knowledgeable about operations and work practices. A minimum of once a year is suggested.

(2) Provide written documentation of the walk-through evaluation. Documentation should include date, area(s) visited, risk factors identified, and actions taken (if any). If prioritized follow-up is needed, it will also be documented.

b. Special surveillance may be indicated for—

(1) Specific jobs where a high incidence of WMSDs has been demonstrated.

(2) Specific jobs that have been identified as high risk based on systematic active surveillance and detailed analysis as discussed in Chapter 3.

c. Baseline and periodic health assessment results will be maintained in personnel medical records. Attention will be given to any changes that could indicate a WMSD.

#### 5-8. Reporting

Occupational health, safety, and health care personnel will use the following forms to document WMSDs and perform passive surveillance. These findings will be reported to the ergonomics subcommittee.

- a. OSHA No. 200 or equivalent.
- b. DOL Form CA-2 (all WMSDs except back injuries).
- c. DOL Form CA-1, CA-16, and CA-17 (Duty Status Report) (back injuries).
- d. Standard Form (SF) 600 (Chronological Record of Medical Care) in the medical record.
- e. DA Form 3075 (Occupational Health Daily Log).

f. DA Form 285 and DA Form 285\_AB-R for reporting military occupational illnesses according to AR 385-40, paragraph 2-8.

#### 5-9. Worksite evaluation referrals

a. Health care personnel who are treating a patient with a suspected WMSD will request a worksite evaluation for the patient through the IEO and the ergonomics subcommittee. Trained ergonomics personnel, together with health care personnel, should conduct the worksite evaluation.

b. Flow diagrams depicting the handling of traumatic injury and occupational disease and illness are available in USACHPPM TG 220.

## Chapter 6

### *Education and Training*

#### 6-1. The "train the trainer" concept

Administer training programs in a pyramid fashion.

a. Ergonomics experts provide training to develop trained personnel.

b. Trained ergonomics personnel--

(1) Then train others at the installation level, including supervisors and workers.

(2) May also train special assistants, who can help with recognizing WMSDs. The special assistants may be representatives from each department or division who assist other department members in recognizing and reporting WMSDs.

#### 6-2. Education Requirements

a. The IEO will have--

(1) A minimum of 40 hours formal ergonomics training. Formal training is defined as classroom instruction, exercises, supervised work assessment, and individual learning assignments.

(2) Training and experience sufficient to identify WMSDs and risk factors.

b. Trained ergonomics personnel will have--

(1) A minimum of 40 hours ergonomics training.

(2) Training and experience sufficient to identify WMSDs and risk factors.

c. Core ergonomics subcommittee members, support and advisory ergonomics subcommittee members, and installation-level personnel providing assistance in recognizing WMSDs will have basic ergonomics training, to include elements listed in 6-3c(2), form trained ergonomics personnel.

#### 6-3. Training Requirements

Personnel responsible for administering the installation ergonomics program will receive appropriate special training. Training is necessary for Active Army, US Army Reserve (USAR), and Army National Guard (ARNG) personnel and all levels of civilian personnel to enable them to understand and recognize potential WMSDs and actively participate in the ergonomics effort.

a. Personnel requiring training.

(1) All DA personnel who are potentially exposed to WMSDs.

(2) Supervisors.

(3) Managers.

(4) Engineers and maintenance personnel.

(5) Installation SOH personnel.

b. Personnel who may conduct training.

(1) Trained ergonomics personnel.

(2) Suitable health care personnel will conduct specific portions of training, such as those related to health risks.

c. Curriculum considerations. Trained ergonomics personnel will--

(1) Present training at a level

appropriate to ensure audience comprehension.

(2) Include in the training curriculum an overview of--

(a) The potential risk of WMSDs.

(b) The possible causes and symptoms.

(c) How to recognize and report symptoms.

(d) The means of prevention.

(e) The sources of treatment.

(3) Include methods for evaluating the effectiveness of the ergonomics effort, as discussed in Chapter 7.

d. Types of training.

(1) General training. Personnel who are potentially exposed to WMSDs will receive formal instruction on hazards associated with their jobs and equipment. Personnel will receive training at an initial orientation and annually thereafter. This training includes elements listed paragraph 6-3c(2).

(2) Specific training. New and reassigned military and civilian personnel who are potentially exposed to WMSDs will receive an initial orientation and hands-on training from trained ergonomics personnel and the immediate supervisor prior to being placed in a full-production position. The initial orientation will include--

(a) A demonstration of the proper use and care of, and the proper operating procedures for, all tools and equipment.

(b) Use of safety equipment.

(c) Use of safe and proper work procedures, such as proper lifting techniques.

e. Training documentation. All ergonomics training will be documented on an appropriate sign in roster and retained at the worksite for 2 years.

## Chapter 7

### *Ergonomics Program Evaluation*

#### 7-1. Evaluation requirements

Each installation's ergonomics program is evaluated by external and internal sources to assess program effectiveness.

**7-2. External evaluations**

a. Authorized OSHA inspections may result in citations to the activity commander for ergonomic deficiencies identified in the workplace.

b. Ergonomics Program personnel at USACHPPM, on request from the installation, may--

(1) Conduct installation ergonomics surveys.

(2) Evaluate elements of the ergonomics program.

(3) Assist with ergonomics program development.

c. Each installation will continue to use existing reporting guidelines in AR 385-40, paragraph 2-6.

**7-3. Internal evaluations**

The IEO ensures evaluation of the ergonomics effort regarding program participation and effectiveness. Methods of measuring both of these elements are listed below.

a. Program participation.

(1) Number of requests for ergonomic assistance by management occurring during a specified period.

(2) Number of personnel suggestions related to ergonomics during a specified period.

(3) Number of educational programs in ergonomics offered or number of personnel attending educational programs.

b. Program effectiveness.

(1) Number of general of systematic identifications of potential WMSDs.

(2) Number of detailed analysis conducted (para 3-3).

(3) Number of high priority listings relating to ergonomics.

(4) Change in incidence rate (see glossary) of ergonomically related FECA claims or dollar amount of new FECA claims within a particular period.

(5) Change in the incidence rate of ergonomically related illness or injury reports filed for military and civilian personnel.

(6) Change in the incidence rate of ergonomically related illness or injury by department or unit.

(7) Change in the incidence rate of lost- or restricted-duty time due to ergonomically related illness or injury.

(8) Change in the number of new job reassignments due to ergonomically related illness or injury.

(9) Change in productivity or production costs that can be attributed to ergonomic interventions.

c. In some cases, there may be an increase in illness or injury reporting at the start of an ergonomics program due to increased personnel and supervisor awareness. The reporting rate will decrease as a well-managed, effective ergonomics program is integrated into the workplace.

**7-4. Regular evaluation and review**

a. The IEO and the ergonomics subcommittee--

(1) Conduct at least a semiannual program evaluation and review.

(2) Present the results of this program evaluation and review to the installation SOH advisory council.

(3) Communicate the results of this program evaluation and review to top management and all workplace personnel.

b. The program evaluation assesses the implementation, progress, and effectiveness of the ergonomics plan. It should include--

(1) Summary progress report or program update.

(2) Summary of results of external evaluations as defined in paragraph 7-2 and program participation and program effectiveness measures as defined in paragraph 7-3.

(3) Plans, goals, and accomplishments for the program as a whole by the critical program elements cited in paragraph 3-4a(3).

(4) Identification of trends, deficiencies, and corrective action needed.

(5) New or revised program goals, priorities, and time lines.

c. The following information can be used to develop the evaluation and review.

(1) Analysis of trends in injury or illness rates according to--

(a) Health care facility sign-in logs.

(b) OSHA No. 200 or equivalent log.

(c) Individual personnel medical records.

(d) The Defense Occupational Health Readiness System (e.g., HHIM and MIM).

(2) Review of the results of installation evaluations.

(3) Before and after surveys or evaluation of worksite improvements.

(4) Observation of work practices to determine the effect of training and education.

**8 May 1998**

**NTC Reg 385-10-1**

(5) Personnel surveys or interviews conducted by department, job title, or work area to monitor trends.

**Appendix A**  
**References**

**Section I**  
***Required Publications***

**AR 40-5**  
Preventive Medicine

**AR 385-10**  
The Army Safety Program

**AR 385-40**  
Accident Reporting and Records

**AR 690-800**  
Insurance and Annuities

**Section II**  
***Related Publications***

**AR 40-3**  
Medical, Dental, and Veterinary Care.

**AR 40-10**  
Health Hazard Assessment.

**AR 602-2**  
Manpower and Personal Integration (MANPRINT) in the Materiel Acquisition Process.

**DODI 6055.1 (DRAFT)**  
DOD Occupational Safety and Health Program.

**EO 12196**  
Occupational Safety and Health Program for Federal Employees.

**PL 91-596**  
Occupational Safety and Health Act of 1970, as amended (29 USC 651, et seq. (1976)).

**TB MED 503**  
The Army Industrial Hygiene Program.

**5 CFR 339.301**  
Authority to Require an Examination.

**29 CFR 1960.8**  
Agency Responsibilities.

**ANSI Z-365 (Working Draft)**  
American National Standards Institute. (1996).  
Control of Work-Related Cumulative Trauma Disorders, Part I: Upper Extremities. National Safety Council (NSC), Itasca, IL.

**USACHPPM (DRAFT)**

Ergonomics in Action. U.S. Army Center for Health Promotion and Preventive Medicine and the U.S. Army Safety Center.

**Unnumbered Publication**

Chapanis, A., 1991. To Communicate the Human Factors Message, You Have to Know What the Message is and How to Communicate It. Human Factors Society Bulletin, Vol. 34 (11):1-4.

**Unnumbered Publication**

Directorate of Civilian Personnel and Safety. 1992. A Supervisor's Guide to the Civilian Resource Conservation Program.

**Unnumbered Publication**

Revised NIOSH Equation for the Design and Evaluation of Manual Lifting Tasks.

**Unnumbered Publication**

U.S. Department of Labor, OSHA. 1991. Ergonomics Program Management Guidelines for Meatpacking Plants, OSHA Publication #3123.

**Unnumbered Publication**

Memorandum, Deputy Under Secretary of Defense (Environmental Security), 4 February 1997, subject: Ergonomics Program Requirements.

**Section III**

***Referenced Forms***

**DA Form 285**

U.S. Army Accident Report.

**DA 285-AB-R**

U.S. Army Abbreviated Ground Accident Report (AGAR).

**DA Form 3075**

Army Occupational Health Report.

**DA Form 3076**

Army Occupational Health Report.

**DOL Form CA-1**

Federal Employee's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation.

**DOL Form CA-2**

Notice of Occupational Disease and Claim for Compensation.

**8 May 1998**

**NTC Reg 385-10-1**

**DOL Form CA-16**

Authorization for Examination And/Or Treatment.

**DOL Form CA-17**

Duty Status Report.

**OSHA No. 200**

Bureau of Labor Statistics Log and Summary of  
Occupational Injuries and Illnesses.

**SF 600**

Chronological Record of Medical Care.

**Appendix B.**

**Recommended Membership of the Ergonomics Subcommittee.**

**B-1. Chairperson**

The IEO—

- a. Serves as the chairperson of the ergonomics subcommittee.
- b. Will be the Chief, Industrial Hygiene, PVNTMED, who will receive at least 40 hours of formal training in ergonomics (para 6-2a).

**B-2. Membership**

The ergonomics subcommittee will include, but need not be limited to, representative of the following offices:

- a. Core membership.
  - (1) Occupational Health.
  - (2) NTC Safety Office.
  - (3) ITT Safety Office.
  - (4) Johnson Controls Safety Office.
  - (5) HUGHES Safety Office.
  - (6) Operations Group Safety.
  - (7) Unions.
  - (8) CPAC.
- b. Support and advisory membership.
  - (1) Director of Contracting
  - (2) DPW.
  - (3) Director of Logistics.
  - (4) Engineers and maintenance personnel.

**B-3. Training**

All subcommittee members should receive appropriate ergonomics training as discussed in chapter 6.



8 May 1998

NTC Reg 385-10-1

**Glossary**

**Section I**

**Abbreviations**

**AGAR**

Abbreviated Ground Accident Report

**ANSI**

American National Standards Institute

**AR**

Army Regulation

**ARNG**

Army National Guard

**CFR**

Code of Federal Regulations

**CPO**

Civilian Personnel Office

**CTD**

Cumulative Trauma Disorder

**DA**

Department of the Army

**DA PAM**

Department of the Army Pamphlet

**DOD**

Department of Defense

**DODI**

Department of Defense Instruction

**DOL**

Department of Labor

**DPW**

Director of Public Works

**EO**

Executive Order

**FECA**

Federal Employee Compensation Act

**HHIM**

Health Hazard Information Module

**HQDA**

Headquarters, Department of the Army

**IEO**

Installation Ergonomics Officer

**IH**

Industrial Hygiene

**IMA**

Installation Medical Authority

**MACOM**

Major Army Command

**MANPRINT**

Manpower and Personal Integration

**MIM**

Medical Information Module

**MTF**

Medical Treatment Facility

**NAF**

Nonappropriated Fund

**NIOSH**

National Institute for Occupational Safety and Health

**NSC**

National Safety Council

**OH**

Occupational Health

**OSH**

Occupational Safety and Health

**OSHA**

Occupational Safety and Health Administration

**OTSG**

Office of the Surgeon General

**PPE**

Personal Protective Equipment

**PL**

Public Law

**PVNTMED**

Preventive Medicine

**RCS**

Requirement Control Symbol

**SF**

Standard Form

**SOH**

Safety and Occupational Health

**TB MED**

Technical Bulletin, Medical

**TDA**

Table of Distribution and Allowances

**TG**

Technical Guide

**TOE**

Table of organization and equipment

**USACHPPM**

U.S. Army Center for Health Promotion and Preventive Medicine

**USAR**

U.S. Army Reserve

**USASC**

U.S. Army Safety Center

**WMSD**

Work-Related Musculoskeletal Disorder(s)

**Section II**

**Terms**

**Anthropometry**

Anthropometry refers to the study of the physical dimensions of people, including size, breadth, girth, distance between anatomical points, and joint range of motion. This information is used in the design and analysis of workspaces, tools, and equipment.

**Cumulative Trauma Disorders (CTD's)**

CTDs are disorders of the musculoskeletal or nervous system which are the result of, or contributed by, the biomechanical risk factors listed in paragraph 2-4. CTDs are a class of musculoskeletal disorders involving damage to the tendons, tendon sheaths, and the related bones, muscles and nerves. Synonymous terms include repetitive motion injury, occupational overuse syndrome, and repetitive strain injury.

**Equivalent civilian training**

Minimum of 40 hours training covering work-related musculoskeletal disorders (WMSDs); workstation and job design; hand tool design; current regulatory requirements and issues; analysis and design of manual materials handling tasks; analysis and design of the office environment; and conducting, analyzing,

documenting, and presenting an ergonomic worksite evaluation, including hands-on experience.

**Ergonomics**

Ergonomics is a body of knowledge about human abilities, human limitations, and other human characteristics that are relevant to the design of tools, machines, systems, tasks, jobs, and environments for safe, comfortable, and effective human use. The aim of the discipline is to fit the job to the person in order to—

- a. Prevent the development of occupational injury or illness.
- b. Reduce the potential for fatigue, error, or unsafe acts.
- c. Increase effective, efficient work.

**Ergonomics expert**

The ergonomics expert—

- a. Possesses a recognized degree or professional credentials in ergonomics or human factors engineering (typically a master's or doctorate degree).
- b. Demonstrates the ability to identify and correct WMSDs in the workplace.
- c. Teaches the 40-hour ergonomics course for trained ergonomics personnel.
- d. Provides consultation only in cases in which trained ergonomics personnel are unable to solve identified problems. In most cases, an ergonomics expert, will not be able to teach at each installation.

**Ergonomics team**

The ergonomics team refers to those responsible for identifying and correcting occupational hazards in the workplace, including trained ergonomics personnel, health care providers, industrial hygienists, safety personnel, engineers, and other support personnel, managers, and supervisors.

**Health care personnel**

Health care personnel include physicians, chiropractic physicians, nurses, occupational therapists, physical therapists, physicians assistants, and other health care professionals and their related, supervised technicians (for example, certified occupational therapy assistants and licensed practical nurses). Health care personnel participating in the ergonomics program should have training in basic ergonomics and epidemiology and be up-to-date in the system recognition, evaluation, treatment, and rehabilitation of WMSDs.

**Incidence Rate**

Incidence (new case) rate (per 100 worker-years per year):

$$\frac{\text{Number of new cases during the past 12 months} \times 200,000 \text{ hours}}{\text{Number of work hours during the past 12 months}}$$

Severity (lost workdays) rate (per 100 worker-years per year):

$$\frac{\text{Number of lost workdays during the past 12 months} \times 200,000 \text{ hrs}}{\text{Number of work hours during the past 12 months}}$$

Prevalence (all cases during period) rate (per 100 worker-years per year):

$$\frac{\text{Total number of cases in the past 12 months} \times 200,000 \text{ hours}}{\text{Number of work hours during the past 12 months}}$$

a. Use incidence rates if possible, as the incidence rate measures new cases occurring over a period of time, while prevalence rates give a "snapshot" picture of the number of individuals affected at a specific point in time. Incidence rate and severity rate allow monitoring of changes over time, rather than recounting chronic problems throughout the duration of the illness or injury.

b. Consistency in reporting is important; therefore, one should use either incidence, severity or prevalence rates for purposes of comparison.

c. If the specific number of work hours during the past 12 months is not available, multiply the number of full-time equivalent employees in each area by 2,000 hours to obtain the denominator.

**Microtrauma**

Microtrauma refers to a series of minor stresses to the body, each of which alone does not cause discernible damage; however, their accumulation over time can lead to WMSDs. These disorders (injuries or syndromes) are also known as CTDs, overuse disorders, repetitive motion injuries, repetitive strain injuries, and occupational motion-related injuries.

**Multiple causation**

The combined effect of several risk factors in one job, operation, or workstation, which may increase the possibility of WMSDs.

**Occupational hazards**

Occupational hazards refer to workplace conditions that may harm the worker: improperly designed workstations, tools and equipment; improper work methods; and excessive tool or equipment vibration. Other examples include aspects of work flow, line speed, posture, force required, work and rest regimens, and repetition rates.

**Occupational illness and injury**

a. To be recorded as an occupational illness or injury, the condition must be diagnosed by a physician, registered nurse, or other person who, by training or experience, is capable of making such a determination (such as occupational therapist, physical therapist, or physician assistant).

b. To be classified as an occupational illness or injury, the condition must meet the following criteria:

(1) Either physical findings or subjective symptoms must exist, that is, at least one physical finding (for example, positive Tinel's, Phalen's, or Finkelstein's test; swelling, redness, or deformity; or loss of motion or strength) or at least one subjective symptom (for example, pain, numbness, tingling, aching, stiffness, or burning).

(2) At least one of the following response actions must occur: medical treatment (including self-administered treatment if made available to personnel by their employer), lost or restricted work activity, or transfer or rotation to another job.

(3) Cumulative trauma disorders must be associated with repeated trauma, and exposure at work must have caused or contributed to the onset of symptoms or aggravated existing symptoms.

**Pinch grip**

A grip that involves one or more fingers and the thumb.

**Trained ergonomics personnel**

Trained ergonomics personnel are health care, industrial hygiene, environmental science, safety, or engineering personnel with approved training in ergonomics. Minimum acceptable training for installation-level trained ergonomics personnel is the 40-hour ergonomics course offered by USACHPPM or equivalent civilian training.

**Working community**

The working community includes all members of the work environment, at all levels of authority. It consists of major command (MACOM) commanders, installation commanders, the IMA, the designated IEO, identified ergonomics personnel, health care personnel, safety personnel, CPO, contracting support, DPW, logistics, union representatives, unit commanders, supervisors, and active duty military and civilian personnel. For the program to be successful, all members of the working community must be considered equal and must share the commitment to ergonomics.

**Work-related musculoskeletal disorders (WMSDs)**

a. Work-related musculoskeletal disorders include the range of health problems arising from repeated stress to the body encountered in the workplace. These health problems may also affect the nervous and neurovascular systems and may include the various occupationally induced CTD's, cumulative stress injuries, and repetitive motion disorders.

b. Examples of WMSDs include damage to tendons, tendon sheaths, synovial lubrication of the tendon sheaths, bones, muscles, and nerves of the hands, wrists, elbows, shoulders, neck, back, and legs. Some WMSDs that are reported include chronic back pain, carpal tunnel syndrome, DeQuervains disease, epicondylitis (tennis elbow), Raynaud's syndrome (white finger), synovitis, tenosynovitis, stenosing tenosynovitis crepitans (trigger finger), and tendinitis.

**Worksite**

Worksite refers to a work area or work environment.

**Workstation**

Workstation refers to an individual person's work area, such as a desk, chair, and computer terminal or an individual inspection station.